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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,388	08/28/2001	Donald A. Shiffler II	PRS077	5684

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EXAMINER

ROY, SIKHA

ART UNIT PAPER NUMBER

2879

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/682,388

Applicant(s)

SHIFFLER ET AL.

Examiner

Sikha Roy

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

The Amendment, filed on July 23, 2003 has been entered and is acknowledged by the Examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4,5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 4,5 recite the limitation "anode/cathode" in claim 3 which recites the coating of anode/collector. There is insufficient antecedent basis for this limitation in the claims. Furthermore it is to be noted that cathode is not a collector.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6, 7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,137,477 to Krol et al.

Regarding claim 6 Krol et al. disclose (Fig. 3 column 1 lines 10-25, column 3 lines 35-40, column 5 lines 15-22) grid electrodes for an electron tube comprised of solid part 4 having a coating of porous carbon char (carbonized synthetic resin) and a thin layer of pyrolytic graphite deposited over the char layer. The Examiner notes that the claim limitation that "pyrolytic carbon deposited by chemical vapor deposition" is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113). Therefore, it is the position of the examiner that it would have been obvious to one of ordinary skill in the art that the electrode disclosed by Krol et al. is at least a fully functional equivalent to the Applicant's claimed anode/collector.

Regarding claim 7 Krol discloses (column 7 lines 5-8) the anode (solid part 4 in Fig. 3) is comprised of metal such as molybdenum, tantalum.

Regarding claim 10 Krol discloses (column 4 lines 29-40) the coating comprising carbonized resin is formed by baking (heating) the electrode with strands of synthetic resin in a non-oxidizing (inert) atmosphere.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,137,477 to Krol et al.

Claim 8 differs from Krol in that Krol does not explicitly disclose the coating applied solely to electron impact surface of the anode.

The anode in an electron tube is the collector of electrons from the cathode and Krol discloses that the electrode having coating of porous carbon char covered with pyrocarbon providing good electrical and mechanical properties. Therefore it would have been obvious to modify the electron impact surface of the anode of Krol by the coating for better performance of the electron tube.

Claims 3-5, 9, 11 - 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,137,477 to Krol et al. in view of U.S. Patent 4,034,031 to Lersmacher et al.

Regarding claim 3 Krol et al. disclose (column 1 lines 5-22, column 6 lines 20-45) method of coating anode/collector (grid electrode) used in electron tube comprising of coating the surface of the carbon electrode by phenol resin (in powder or granulate form), then carbonization of the resin, carried out by baking in a furnace at a

Art Unit: 2879

temperature upto 800 °C and deposition of pyrolytic graphite for increasing thermal and electrical conductivities of the electrode. Krol et al. further disclose (column 5 lines 56-58) baking the electrode in a vacuum to 1600 °C to remove any remaining impurities.

Krol et al. do not explicitly disclose the deposition of pyrocarbon material by pyrolysis through chemical vapor deposition.

Lersmacher et al. in relevant art of method of manufacturing grid electrodes disclose (column 2 lines 31-50) forming a layer of pyrolytic carbon covering the carbonized carbon (glassy carbon) layer by pyrolysis through vapor deposition of hydrocarbon at a specified temperature and pressure. Lersmacher further discloses (column 1 lines 43-45, column 2 lines 43-50) that these grid electrodes with lining layer of pyrolytic carbon deposited by chemical vapor deposition method provides perfect homogeneous structure of the electrode with faultless operation and provides attainment of better vacuum due to absence of pores.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to deposit the pyrocarbon on the carbonized resin of the electrode of Krol et al. by chemical vapor deposition process, as disclosed by Lersmacher et al. for providing perfect homogeneous structure of the electrode with faultless operation and attainment of better vacuum due to absence of pores.

Claim 11 essentially recites the same limitation as of claim 3 and hence is rejected for the same reason.

Regarding claim 4 Krol et al. disclose the carbonization of the resin is carried out in an inert atmosphere at a temperature to approximately 800 °C.

Regarding claim 5 Krol et al. disclose (column 4 line 10-15) carbonizable resins are phenol resins (strands of phenol resins, phenol resin plates and foils).

Regarding claim 9 Lersmacher discloses (column 3 lines 20-43) second layer of pyrocarbon coated on the electrode increasing the thickness of the coating.

Regarding claim 12 Lersmacher discloses (column 2 lines 33-50) that the pyrocarbon is deposited by flow of hydrocarbon gas (propane C_3H_8) over the sleeve after heating the surface to $2000^{\circ}C$ ($2300^{\circ}K$).

Referring to claim 13 Krol discloses (column 5 lines 57-59) the electrode is heated in vacuum up to $1600^{\circ}C$ to remove any impurities.

Regarding claim 14 Krol discloses (column 4 lines 40-65) that carbonization is carried out by heating phenol resin at a temperature when the starting material decomposes, volatile components are released via solid state diffusion and transformation of polymer to carbon (char) takes place.

Claim 15 recites the same limitation as of claim 4 and hence is rejected for the same reason.

Claim 16 recites the same limitation as of claim 5 and hence is rejected for the same reason.

Claim 17 recites the same limitation as of claim 12 and hence is rejected for the same reason.

Claims 18 and 19 essentially recite the same limitations as of claims 3 and 4 and hence are rejected for the same reason.

Regarding claim 20 Lersmacher discloses carbon deposition includes pyrolysis through chemical vapor deposition.

Claims 21 and 22 essentially recite the same limitation as of claims 12 and 13 respectively and hence are rejected for the same reasons (see rejection of claims 12 and 13).

Response to Arguments

Applicant's arguments with respect to claims 3-5 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 4,392,238 to Lersmacher et al. and U. S. Patent 4,901,338 to Rodhammer et al. disclose pyrolytic coating deposition by chemical vapor deposition.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

Art Unit: 2879

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

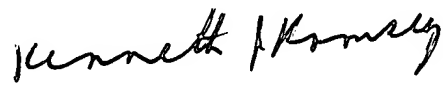
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (703) 308-2826. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (703) 305-4794. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

S.R.

Sikha Roy
Patent Examiner
Art Unit 2879


KENNETH J. RAMSEY
PRIMARY EXAMINER